Before the
**NATIONAL TELECOMMUNICATIONS & INFORMATION ADMINISTRATION**
**AND THE**
**RURAL UTILITIES SERVICE**
Washington, D.C.

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| Joint Request for Information | ) | Docket No. 0907141137–91375–05 |
| To: NTIA & RUS | ) | RIN: 0660-ZA28; RIN: 0572-ZA01 |

# COMMENTS OF INTERNET2

Respectfully submitted,

**INTERNET2**

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## EXECUTIVE SUMMARY

Internet 2 is a national middle mile backbone provider, whose network, which is located in 38 states, supports the provision of broadband services to more than 66,000 community anchor institutions located in all 50 states.

There are ordinarily two essential networks involved in the provision of high capacity broadband service to any anchor institution: (i) the middle mile backbone network; and (ii) the final mile anchor network. If either one of these networks lacks sufficient capacity, there will be a bottleneck. Thus, facilities such as Internet2's national middle mile backbone network are critical pieces of the puzzle needed for the successful provision of high capacity broadband services to anchor institutions.

National middle mile backbone providers such as Internet2, however, can only realistically apply for funding if the application requirements for such national projects are not unduly onerous for such type of provider. Internet2, of course, cannot practically provide the level of detail about each of the more than 66,000 anchor institutions its network benefits, and the corresponding census blocks and communities, that can readily be provided by a provider that is benefiting 6, rather than 66,000, such anchor institutions. Yet it is critical that projects that would benefit the most anchor institutions in one fell swoop, such as Internet2's project, are not effectively barred from seeking funding because the level of detail required by the application for such national projects is too onerous to complete.

For the reasons discussed in these comments, (i) national middle mile backbone providers are eligible for funding under BTOP and BIP; (ii) national middle mile backbone networks are critical to the deployment of high capacity broadband to anchor institutions, and the funding of such networks is necessary; (iii) the Agencies should modify the application process for such providers, in the manner described in these comments, to ensure that they have a reasonable opportunity to seek funding under the ARRA; and (iv) the Agencies should utilize evaluation criteria that ensures that there is a proper balance of funding in connection with high capacity broadband services for anchor institutions, which includes funding of both national middle mile backbone networks and final mile anchor networks.

In addition, the Agencies should adopt the other recommendations of Internet2 set forth herein, including (i) eliminating the requirement for state review of applications where the project is national in scope; and (ii) modifying the definition of unserved and underserved areas as to anchor institutions so as to be consistent with the requirements of such institutions.

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## COMMENTS OF INTERNET2

Internet2 hereby submits these comments in response to the joint request for information (the "RFI") of the National Telecommunications & Information Administration ("NTIA") and the Rural Utilities Service ("RUS") relating to the implementation of a second round ("Round 2") of funding for the Broadband Technology Opportunities Program ("BTOP") and Broadband Initiatives Program ("BIP"), as part of the American Recovery & Reinvestment Act (the "ARRA").[1]

Internet2 is a national middle mile backbone provider,[2] whose network, which is located in 38 states, supports the provision of broadband services to more than 66,000 community anchor institutions located in all 50 states.

## INTRODUCTION

NTIA and RUS (the "Agencies") seek to fund the very best projects that meet the goals of the ARRA. But the Agencies can only do so if all types of broadband providers, including national middle mile backbone providers, are able to apply for funds without having to attempt to satisfy application requirements that are so unduly onerous and wholly impractical for such type of provider, that they are effectively barred from seeking funds.

[1] Joint Request for Information, 74 Fed. Reg. 58940 (November 16, 2009).
[2] The term "national middle mile backbone provider," as used herein, is defined in Section I below.

Application requirements must be designed to ensure that both of the following are true: (i) the Agencies receive the information that they need to determine which projects to fund, and (ii) no type of provider is effectively precluded from applying because the application requirements are unduly onerous, and wholly impractical, for such type of provider. Thus, the application requirements must be drafted with an eye towards ensuring that each type of provider can realistically acquire and provide the requested information without undue burden and expense, and if certain categories of providers cannot do so given the nature of their project (e.g., it is national in scope), that must be taken into account. That is, the Agencies should modify the application requirements for certain categories of providers, where such providers cannot otherwise realistically comply with those requirements. Any other approach will fail to ensure that the Agencies have an opportunity to consider the best projects for funding. Simply put, when it comes to application requirements here, this is not a situation where "one size fits all."

Moreover, a project from a national middle mile backbone provider, such as Internet2, is likely to benefit more anchor institutions than virtually any other proposed project submitted for funding. Thus, the last thing the Agencies should want to do is to effectively prevent entities that operate national middle mile backbone networks from seeking funding.

The Agencies appear to recognize that there is a need for modified application requirements for national providers. In the RFI, the Agencies specifically seek comment regarding whether "any steps should be undertaken to adjust applications for satellite systems that provide nationwide service....?"[3] The answer to that question is clearly yes, and the same reasoning that compels modifying the application requirements for national satellite providers (e.g., undue burden and impracticability of complying with requirements designed for local providers), applies with at least equal force for national middle mile backbone providers.

[3] RFI at 7.

Moreover, not only is it critical for the application requirements to permit national middle mile backbone providers to apply without undue burden, it is equally important that the evaluation criteria utilized readily allows for the funding of such providers.

For the reasons discussed below, (i) national middle mile backbone providers are eligible for funding under BTOP and BIP; (ii) national middle mile backbone networks are critical to the deployment of high capacity broadband to anchor institutions, and the funding of such networks is necessary; (iii) for Round 2, the Agencies should modify the application process for such providers to ensure that they have a reasonable opportunity to seek funding under the ARRA; and (iv) for Round 2, the Agencies should utilize evaluation criteria that ensures that there is a proper balance of funding in connection with high capacity broadband services for anchor institutions, which includes funding of both national middle mile backbone networks and final mile anchor networks (defined below).[4]

## DISCUSSION

### I. NATIONAL MIDDLE MILE BACKBONE NETWORKS

As used herein, the following terms have the meanings set forth below.

1. "Final mile anchor networks" refer to networks that directly service anchor institutions.

2. "Final mile anchor providers" refer to entities that manage and operate final mile anchor networks.

[4] In a related context, the FCC issued a public notice seeking comment on middle mile facilities, which it recognizes are "important facilities" that a number of entities believe "play an important—if not gating—role in the economics of broadband deployment, particularly in rural, unserved, and underserved areas." Public Notice, Comment Sought on Impact on Middle and Second Mile Access on Broadband Availability and Deployment, NBP Public Notice #11, GN Docket Nos. 09-47, 09-51, 09-137 (2009). In the comments filed in that proceeding, numerous parties discussed the critical importance of middle mile networks. See, e.g., Comments of Covad Communications Company, GN Docket Nos. 09-47, 09-51, 09-137 (Nov 4, 2009) ("Covad Comments") at 2-5, & n.5; Comments of Fiberlight, Docket Nos. 09-47, 09-51, 09-137 at 7-8, 11-12 (Nov 4, 2009). See, also, Comments of EDUCAUSE, Internet2 and ACUTA, GN Docket No. 09-51 at 1-2 (June 8, 2009) ("[T]o truly have access to broadband, there must be adequate facilities at all levels, final mile AND middle mile facilities must both be available and affordable.")

3. "Middle mile backbone networks," refer to networks that connect final mile anchor networks to each other.

4. "Middle mile backbone providers" refer to entities that manage and operate middle mile backbone networks.

5. "National middle mile backbone networks" refer to middle mile backbone networks that are located in more than 25 states, and that benefit community anchors or end-users in all 50 states.

6. "National middle mile backbone providers" refer to entities that manage and operate national middle mile backbone networks.

A. Congress Intended for Middle Mile Backbone Networks to be Eligible for Funding under the ARRA

In the Conference Report (the "Conference Report") issued in connection with the passage of the ARRA, Congress made it clear that middle-mile providers and providers of long haul facilities should be considered for grants under the ARRA.[5] Middle-mile backbone providers are both middle mile providers under the Agencies' definition of "middle mile" (because they are certainly not final mile providers), as well as providers of long haul facilities. The Conference Report further stated that backhaul providers should be eligible for funding, and middle mile backbone providers are also frequently referred to as backhaul providers.[6] Accordingly, it is clear that the intent of Congress is for the Agencies to consider funding national middle mile backbone providers.

[5] H.R. REP. NO. 111-16, at 774 (2009) (Conf. Rep.) ("The Conferees also intend that the NTIA select grant recipients that it judges will best meet the broadband access needs of the area to be served, whether by a wireless provider, a wireline provider, or any provider offering to construct last-mile, middle-mile, or long haul facilities.")

[6] *Id.* at 775 ("It is the intent of the Conferees that, consistent with the public interest and purposes of this section, as many entities as possible be eligible to apply for a competitive grant, including wireless carriers, wireline carriers, backhaul providers, satellite carriers, public-private partnerships and tower companies.")

B. National Middle Mile Backbone Networks are Critical to the Deployment of High Capacity Broadband to Anchor Institutions, and the Funding of Such Networks is Necessary (Section IIA of RFI)

1. National Middle Mile Backbone Networks are Critical to the Deployment of High Capacity Broadband to Anchor Institutions

Ensuring that middle mile backbone providers, including national middle mile backbone providers such as Internet2, are eligible for funding makes perfect sense. In fact, facilities such as Internet2's network are critical pieces of the puzzle needed for the successful provision of high capacity broadband services to anchor institutions. Both Congress[7] and the Agencies[8] recognize that ensuring high capacity broadband service to anchor institutions is essential to this country. Yet, that cannot occur without sufficient support from national middle mile backbone networks.

There are ordinarily two essential networks involved in the provision of high capacity broadband service to any anchor institution: (i) the middle mile backbone network; and (ii) the final mile anchor network. If either one of these networks lacks sufficient capacity, there will be a bottleneck. And when there is a bottleneck, regardless of which network is deficient, the result is the same: the anchor institution will not receive the high capacity broadband service it needs.

By analogy, if the local roads were wide, well paved roads that were sufficient for the prompt delivery of the U.S. mail, but the interstate highways were too narrow given the traffic they need to hold (and there was not sufficient air service to carry the interstate mail), the mail service would be severely derailed even though the final mile of the service would be readily

[7] See discussion in Section IB(2) below.

[8] The Agencies' recognition of the tremendous importance of community anchor institutions is made abundantly clear in the RFI, as they ask for comment regarding whether they should "focus on or limit round 2 funding [to] projects that will deliver middle mile infrastructure facilities into a group of communities and connect key anchor institutions within those communities." RFI at 5.

supported by excellent roads. Similarly, here, if the middle mile backbone networks are ignored, and the focus is exclusively on funding final mile anchor networks, one of the two links in the chain of delivery of high capacity broadband service to anchor institutions will be greatly compromised. But each part of the chain of networks is equally important, and if either one is deficient, anchor institutions and those they serve will not receive the benefits of high capacity broadband. The old adage that a chain is only as strong as its weakest link certainly applies here.

In recent testimony submitted to the Committee on Commerce, Science & Transportation, United States Senate, Lawrence Strickling, Assistant Secretary for Communications and Information for NITA, stated as follows:

> I assure you these [ARRA] funds will be money well spent. Just as investments in transportation infrastructure supported the development of the national highway system, these investments will serve as valuable building blocks for future private investment that will ultimately deliver the promise of truly ubiquitous broadband.[9]

Assistant Secretary Strickling properly recognized the importance of interstate highways to the entire transportation system. But for the same reasons that interstate highways are critical to the transportation system, sufficient national middle mile backbone networks -- which are in effect the interstate highways for broadband -- are equally critical here, and this is particularly so for connecting and supporting anchor institutions, which the Agencies recognize are integral to the success of broadband deployment and utilization in this country.

In the RFI, the Agencies specifically seek comment on whether they should "target projects that create comprehensive communities' by installing high capacity middle mile facilities between anchor institutions that bring essential health, medical and education services

[9] Testimony of The Honorable Lawrence E. Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration, United States Department of Commerce, Before the Committee on Commerce, Science & Transportation, United States Senate Hearing on Oversight of the Broadband Stimulus Programs in the American Recovery and Reinvestment Act, p.1 (October 27, 2009).

to citizens that they may not have today." The answer is clearly yes. As the Agencies correctly recognize, "[e]nsuring that anchor institutions, such as community colleges, schools, libraries, health care facilities, and public safety organizations, have high-speed connectivity to the Internet can contribute to sustainable community growth and prosperity. Such projects also have the potential to stimulate the development of final mile services that would directly reach end users in unserved and underserved areas."[10] Yet, such comprehensive communities can only be viable if they are fully supported by the interstate highway system for broadband – i.e., national middle mile backbone networks -- such as Internet2's network, which connect the final mile anchor networks. If the Agencies truly want comprehensive connectivity for communities, national middle mile backbone networks such as Internet2's network are instrumental to the achievement of that goal.

Indeed, with respect to health care in particular, the Federal Communications Commission (the "FCC") has already recognized this fact. Under the rural health care pilot program, the FCC explicitly recognized that Internet2's network is a dedicated nationwide backbone that can link health care facilities throughout the country. In fact, pursuant to that program, the FCC agreed to help fund the construction of health care networks that would connect to Internet2's network.[11]

Moreover, with respect to health care providers and all other types of anchor institutions, it is not only important for the end-user anchor institution to receive high capacity broadband service, it is also critical that it receives this service **to** all locations it needs to reach. That is, if a needed expert (whether a doctor, professor or other expert) is located in a distant city, it is extremely important that the network permits high capacity broadband connections between the

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[10] RFI at 5.

[11] In re Rural Health Care Support Mechanism, Order, WC Docket No. 02-60, FCC 06-144 (2006) ("Rural Health Care Pilot Program Order").

end-user anchor institution and such distant locations. Otherwise, the user may have access to nearby physicians or professors (for distance learning), but not to the highest quality professionals who may be located further away or in other states. National middle mile backbone networks can make such national high capacity connections a reality, rather than just a pipe dream.

In fact, in the Rural Health Care Pilot Program Order, the FCC explicitly recognized the importance of health care facilities having access to high capacity connections nationwide, stating as follows:

> Internet2 links a number of government research institutions, as well as academic, public, and private health care institutions that are repositories of medical expertise and information. By connecting to this dedicated national backbone, health care providers at the state and local levels will have the opportunity to benefit from advanced applications in continuing education and research. In addition, a ubiquitous nationwide broadband network dedicated to health care will enhance the health care community's ability to provide a rapid and coordinated response in the event of a national crisis. [12]

2. National Middle Mile Backbone Networks Need Funding

In light of the foregoing, when deciding which entities should receive funding to ensure that anchor institutions have sufficient high capacity broadband service, the Agencies should adopt an approach that reflects the proper balance. That is, without adequate funding to ensure that each of the two networks (i.e., the middle mile backbone network and the final mile anchor network) has sufficient capacity, the benefits to anchor institutions, and the public at large, will simply not be realized.

And there is no question that Internet2's national middle mile backbone network, for example, which is vitally important to so many anchor institutions throughout the country, needs

[12] Rural Health Care Pilot Program Order at par. 2.

funding for significant upgrades and extensions.[13] For at least four reasons, upgrades are needed with respect to capacity.

First, Internet2's national middle mile backbone network is connected to a multitude of final mile anchor networks, most of which provide service to many anchor institutions, and each of which institutions have numerous simultaneous broadband users. Accordingly, given the "triple layer of sharing" involved, as described above, national middle mile backbone networks such as Internet2's network must have extremely high capacity. That is, national middle mile networks need more capacity than final mile anchor networks so that the national networks can adequately serve each of the more local networks. In a similar vein, the final mile anchor networks need more capacity than anchor institutions, and anchor institutions need more capacity than residential consumers. As to the latter point, the analogy used by Internet2 in a recent filing with the FCC is instructive:

> If a caterer receives a request to serve dinner at a particular location, the amount of food necessary is dependent upon one fact: how many people will be served. For example, the amount of food required to serve five hundred people at a business location is far greater than the amount necessary to serve five residents in a single-family home. This same principle applies with respect to broadband. The amount of bandwidth required varies depending upon whether the services are being delivered to an [anchor institution] where several hundred [people] will use it simultaneously, or a family where at most four or five people will use the services. Thus, bandwidth that may be completely satisfactory for individual users in a residential home will be wholly insufficient for an [anchor institution].[14]

Second, national middle mile backbone networks also need tremendous capacity because of the ever-increasing need for greater bandwidth by broadband users. Network traffic continues to grow at astonishing rates, at 50 to 60% per year according to one study,[15] and more bandwidth-

[13] Internet2 does not have firsthand knowledge about the needs of other providers' middle mile backbone networks, and therefore will focus here on its own network with regard to the need for upgrades and extensions.
[14] Reply Comments of Internet 2, GN Docket Nos. 09-47. 09-51, 09-137 at 2 (Sept. 8, 2009).
[15] http://www.dtc.umn.edu/mints/home.php

intensive applications are constantly being developed. As the Commission recognized in its report on a Rural Broadband Strategy:

> Bandwidth-intensive applications could very quickly become the norm in the U.S. - even in rural areas. Technologies that cannot be upgraded easily could make Internet applications less than five years from now look like the dial-up downloads of today.[16]

Therefore, middle mile backbone networks also need extremely high capacity to future-proof those networks, and ensure that all of the bandwidth needed, both now and in the foreseeable future, for distance learning, telemedicine, telepresence and so many other important applications is available. Otherwise, these middle mile backbone networks will be deficient almost immediately after they are built or upgraded.

Third, such capacity is also needed to encourage innovation and new applications. Without the capacity on which to run such new applications, they will not be developed, to the considerable detriment of all Americans. In a recent filing submitted earlier this month to the FCC, Global Crossing discussed the critical importance of Internet2's network in particular with respect to the creation of new and innovate applications in the past, and the need to continue to implement innovative and new applications in the future.[17]

Fourth, at least as to Internet2's network, far more anchor institutions, including many hospitals and health care facilities across the country, want to be connected to final mile anchor networks that in turn connect to Internet2. But this can only occur if Internet2's network has sufficient capacity to support the additional anchor institutions. In addition, extensions to the network are also needed to support adding many additional anchor institutions to the network, and to ensure better and more service in unserved, underserved and rural areas.

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[16] Acting Chairnan Michael J. Copps, Federal Communications Commission, Bringing Broadband to Rural America: Report on a Rural Broadband Strategy, GN Docket No. 09-29 (May 22, 2009), par. 11.

[17] Comments of Global Crossing North America, GN Docket Nos. 09-47. 09-51, 09-137 at 4 (Nov. 4, 2009) ("Global Crossing Comments").

Upgrades to middle mile backbone networks such as Internet2's network are also necessary to serve other important purposes, including pushing the technology envelope for networks to ensure more economical, secure, and innovative internet services to anchor institutions. Such upgrades will permit the use of multicasting, which allows for more economical use of backbone bandwidth. Without multicasting, providers will find themselves in an unwinnable race to constantly upgrade their networks to meet the ever-increasing video demands of consumers. Multicasting, however, enables networks to provide far greater capacity for video without increasing their bandwidth.

Upgrades to middle mile backbone networks such as Internet2's network will also permit anchor institution networks to be completely transparent, thereby rendering it far easier to confirm the actual speeds provided as well as whether all applications are available to any user of the network (as opposed to being blocked or delayed by a provider). In addition, such upgrades will also enable the use of advanced broadband applications that include emerging standardized Internet protocols, such as IPv6, which will ensure that there is no exhaustion of domain addresses.[18]

The language of the ARRA also fully supports funding middle mile backbone providers, and particularly those that enable the provision of high speed broadband service to anchor institutions, such as Internet2. In the ARRA, Congress repeatedly emphasized the importance of "ensuring" that community anchor institutions had sufficient broadband service. Yet, that will

[18] In Global Crossing's comments to the FCC referenced earlier, it also recognized some of the important modifications Internet2 has begun, or is interested in, implementing. See Global Crossing Comments at 4-5, n. 6 ("[T]he Internet2 dynamic circuit network ("DCN"), [is] an advanced technology that allows user-based allocation of high-capacity data circuits over the fiber-optic network. The Internet2 community is actively engaged in developing and deploying emerging network technologies beyond the scope of single institutions and critical to the future of the Internet. These technologies include large-scale network performance measurement and management tools, simple and secure identity and access management tools, and advanced capabilities such as the on-demand creation and scheduling of high-bandwidth high-performance circuits.")

not occur without funding national middle mile backbone networks, which are a critical link in such service.

One of the express purposes of the BTOP is to provide "broadband education, awareness, training, access, equipment and support to ...[s]chools (including institutions of higher education), libraries, medical and health care providers, and other community support organizations to promote greater use of broadband by and through these organizations."[19] The BTOP further provides that grants will be provided in connection with, among other things, "ensur[ing] access to broadband service by community anchor institutions."[20] Moreover, in describing the criteria for applications, the ARRA provides that NTIA must consider whether "an application to deploy infrastructure will ... enhance services for health care delivery, education or children to the greatest population of users."[21]

But to meet these objectives, upgrades to middle mile backbone networks are critical. Such upgrades are necessary if entities such as health care providers, educational facilities and other anchor institutions are to receive the functionality they need. By way of example only, high quality video conferencing used in telemedicine requires significant broadband capacity, which will only be sufficiently available at an anchor institution (given the triple layer of sharing discussed earlier) if there is extremely high capacity available on the middle mile backbone network. Yet, without such high quality video conferencing, numerous citizens in rural areas will not receive the expert medical treatment they need. Similarly, extremely large file transfers (needed for x-ray body scans, for example) can only be provided if middle mile backbone networks (as well as final mile anchor networks) have sufficient capacity.

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[19]BTOP, §6001(b)(3)(A).
[20]BTOP, §6001(f)(3).
[21]BTOP, §6001(h)(2)(C).

The FCC, in implementing its rural health care pilot program, also recognized the tremendous benefits involved in ensuring that health care providers have high capacity broadband connections throughout the country, finding as follows:

> Broadband has enabled health care providers to vastly improve access to quality medical services in remote areas of the country. Among other things, telehealth applications allow patients to access critically needed medical specialists in a variety of practices, including cardiology, pediatrics, and radiology, without leaving their homes or their communities. Using video feeds over broadband and real-time patient information, intensive care doctors and nurses can monitor critically ill patients at multiple locations around the clock. Using this technology, a single medical professional is able to administer services to over a hundred patients, while cutting skyrocketing medical costs by shortening average hospital stays and reducing the need for additional tests and treatments. The benefits of these technologies are particularly apparent in underserved areas of the country that may lack access to the breadth of medical expertise and advanced medical technologies available in other areas.[22]

The FCC, however, also recognized that far more needs to be done in this area: "Because of the enormous benefits of telemedicine applications that ride over broadband facilities, it is essential that the Commission take additional steps to facilitate broadband deployment to health care providers."[23]

The actions of the Agencies here will similarly determine how much progress we make with respect to high capacity broadband service to health care facilities nationwide. In addition, as many parties have recognized, it is equally important to ensure high capacity broadband service to educational institutions. EDUCAUSE, Internet2 and ACUTA, in comments filed earlier this year with the FCC, described the importance of such services to many educational facilities:

> The future of our country and its competitiveness depend on the quality and reach of our higher education. In an ever-changing, highly-competitive, and international economy, our educators must teach students how to

[22] Rural Health Care Pilot Program Order at par. 5
[23] *Id.* at par. 9.

prepare for professions that do not yet exist and work with technologies we cannot yet imagine or comprehend. Because of this, it is essential that campuses have access to the highest broadband speeds available to conduct the education and research our economy demands to remain in the forefront of international scientific discovery. As research becomes increasingly data driven and increasingly international (e.g., the Large Hadron Collider), it is essential that these broadband technologies are upgraded and distributed throughout the campus to serve the needs of students in all disciplines and areas of study. In addition to upgrading on-campus broadband facilities, higher education increasingly depends upon the public broadband network to meet the needs of students, faculty and researchers who are off-campus. Higher education must continually strive to serve a more diverse student population. Online distance education has become an essential tool to overcome geographic barriers and extend the on-campus learning experience more broadly. The demand for online classes has nearly doubled over the past 5 years alone with over 4 million students enrolled in online classes in 2008. Distance education allows students the flexibility to work full time, meet family obligations, and to reduce travel while earning their degree(s). But the quality of online education is dependent on the quality of broadband that is available to connect the instructor with the student. Many rural and underserved urban areas, where the students live, may not have the connection speed necessary to take part in the coursework. To properly extend the reach of higher education, the public must have access to high-speed broadband. [24]

C. The Agencies Should Modify the Application Process for, at a Minimum, National Middle Mile Backbone Providers (Sections IA, IA(3), and IIA(4) of the RFI)

In light of the foregoing, it is clear that national middle mile backbone providers are a critical link in the provision of high capacity broadband service to anchor institutions, and the funding of such networks is necessary. Indeed, without funding for such networks, anchor institutions throughout the country will not have ample broadband service – even if the final mile anchor network that serves them is funded. Regardless of the network within which a bottleneck occurs, anchor institutions are greatly harmed by such bottlenecks.

But funding of national middle mile backbone providers can only occur if such providers actually seek funds, which in turn will only occur if the application process for such providers enables them to apply without having to meet requirements that are unduly onerous for those

[24] Comments of EDUCAUSE, Inernet2 and ACUTA, GN Docket No. 09-51 at 1-2 (June 8, 2009).

type of providers. National middle mile backbone providers should not be inadvertently eliminated (for consideration for funding) by application requirements that are tailored only for other categories of providers, and which therefore render it wholly impractical for national middle mile backbone providers to apply. Simply put, these providers should be judged on the merits of their applications – not prevented from applying because they are inadvertently eliminated by application requirements created with other types of providers in mind. Accordingly, application requirements must take into account, for each type of provider, what information is practical for them to provide. Otherwise, form (the nature of the application requirement) will triumph over substance (i.e., the merit of the proposed project).

In the RFI, the Agencies tentatively conclude that the application process should be streamlined.[25] They should adopt this tentative conclusion. More specifically, and as referenced earlier herein, it appears that the Agencies recognize that national satellite providers (given the scope of their coverage) may very well need different application requirements.[26] The same, of course, is true for national middle mile backbone providers.

Internet2's network, for example, which spans 38 states and supports the provision of high speed broadband services to more than 66,000 community anchor institutions in all 50 states, transverses tens of thousands of census blocks and benefits thousands of communities. Internet2 simply cannot reasonably be asked to provide the level of detail about each of these anchor institutions and the corresponding census blocks and communities, that can readily be provided by a provider that is benefiting 6, rather than 66,000, such anchor institutions. It would be ironic, to say the least, if projects that would benefit the most anchor institutions in one fell swoop, and thereby provide the greatest benefit, were never even proposed to the Agencies

[25] RFI at 3.
[26] *Id.* at 7.

because the level of detail required by the Agencies' application for such projects rendered the application too onerous to complete.

In light of the foregoing, as to national middle mile backbone providers, in lieu of several of the requirements previously imposed in the prior round (discussed in Section IC(1) below), NTIA, and RUS to the extent applicable, should adopt the proposed requirements set forth in Section IC(2) below.[27] Other modifications are discussed in Section IC(3) below, and Section IC(4) addresses another very important issue.

1. Certain Application Requirements in the Prior Round

In the prior round, in connection with questions 12, 14, 17 and 18 of the application, all middle mile applicants seeking BTOP funding were, among other things, required to do the following:

- Identify the name of the middle mile span and identify where it begins and ends.
- Provide service maps for each proposed funded service area.
- Designate each such funded service area as unserved or undeserved.
- Provide a list of contiguous census blocks for each proposed project and the funded service areas.
- Provide a list of associated last mile service areas for each project.
- For each associated last mile service area, indicate the population, the total number of households and businesses and identify critical community facilities, community anchors and public safety entities expected to be direct customers.
- For each associated last mile service area, designate whether such area is unserved or underserved.
- For each community or other area within each final mile service area, specify the number of square miles in such community or other area and whether such community or other area is rural.

[27] The focus in this Section is on BTOP application requirements, but the same principles should be applied to modify the BIP application requirements.

- For each service area, describe the purpose of the connections to anchor institutions, how end users will be served by them, and how they will benefit the community.

- Provide a list of service providers with whom the proposed network proposes to interconnect.

2. Proposed Modifications to Questions 12, 14, 17 and 18 for National Middle Mile Backbone Providers

As to national middle mile backbone providers, in lieu of all of the requirements set forth in the prior round under questions 12, 14, 17, and 18, including those listed above, the following should be required:

- Identify the name of the middle mile span and identify where it begins and ends.

- Provide service maps for each county in each state that will benefit from each project. Applicant may provide one service map that shows all of the counties that will benefit, or multiple maps. *Reasoning: Given there are thousands of service areas involved in a national project, this information can only practically be provided at a county level.*

- Designate at least one funded service area as unserved or underserved. *Reasoning: Given the extraordinary number of funded service areas involved in a national project, it would be impractical and extremely onerous to analyze each such area with respect to whether it is unserved or underserved. Moreover, a national middle mile backbone network that supports a significant percentage of anchor institutions in the country, by definition, will be supporting anchor institutions everywhere, including in unserved and underserved areas. Further, encouraging extensions that purposefully avoid served areas (which would be the case if the emphasis is on funded service areas being located in unserved or underserved areas), would cause the provider to construct circuitous, inefficient routes.*

- Provide a list of census blocks for each interconnection point of the project only. *Reasoning: The Internet2 project, for example, if funds are provided, would include upgrades and expansion to a network that already includes over 13,000 miles, and thus it would be impractical to list tens of thousands of census blocks covering the entire span.*

- Provide a list of counties in each state that will benefit from each project. *Reasoning: Given the extraordinary number of final mile service areas involved in a national project, it would be impractical to determine the exact scope of, and list, each final mile service area. While even providing information on a county by county basis will be extremely difficult, it may be manageable.*

- For each county in a state that will benefit from a project, indicate the population, and the total number of households and businesses in such county (to the extent such information is publicly and readily available). For each state, list the state-wide total number of critical community facilities, community anchors and public safety entities (and categorize them by type of entity) that will benefit from the project. *Reasoning: Listing such entities per county would be overly burdensome, and, in any event, such entities are not "direct" customers.*

- For each county in a state that will benefit from a project, indicate the average mean income of such county, and provide any other readily available public data that may shed light on the level of broadband service to community anchors. *Reasoning: For the reasons discussed above, determining, for every final mile service area in a national project, whether such area is unserved or underserved is onerous and impractical.*

- For each county in a state that will benefit from the project, specify the number of square miles in such county, and if such information is readily available, specify whether the county is rural. *Reasoning: This information cannot practically be provided at a community level because there will be thousands of communities that are beneficially impacted. It will be extremely difficult to provide this information even on a county level.*

- For all service areas collectively, describe in general the purpose of the connections to anchor institutions, how end users will be served by them, and how they will benefit the community. *Reasoning: For a national project with thousands of service areas, this information cannot reasonably be provided separately for each service area.*

- Provide a list of each final mile anchor network provider that may benefit from the proposal and the number of anchor institutions each such provider can reach. *Reasoning: These are the national middle mile backbone provider's "direct" customers.*

**Note: In addition, national middle mile backbone providers should be permitted to provide any or all of the above information using a text exhibit or other**

**uploaded file or drawing, rather than submitting the information directly on the application form (which is often far more burdensome, particularly for a national project in which so much information will need to be provided).**

3. Additional Modifications

In the prior round, if two applications overlapped in terms of funded service areas, only one could receive funding. The overlap rules should not apply at all to national middle mile backbone provider applications because their networks will by their nature and scope overlap in terms of service areas with final mile anchor networks, but both networks are needed for anchor institutions to benefit, and thus funding of both is fully consistent with the ARRA. Otherwise, there will be a bottleneck in one of the two networks, to the detriment of the anchor institution and the citizens they serve.

Question 30 in the prior round assumes that providers may be connecting to backbone providers. For national middle mile backbone providers, this question should be rephrased to request information regarding such providers' connections to final mile anchor networks, rather than the converse. That is, since providers such as Internet2 are backbone providers, the operative question to them should relate, not to connections to other backbone providers, but to connections to final mile anchor networks or other middle mile providers.

4. The Agencies Should Take All Other Action Needed to Ensure that National Middle Mile Backbone Providers are Not Effectively Precluded by the Application Process from Seeking Funds

To ensure that the application process does not effectively preclude national middle mile backbone providers from seeking funds, the Agencies should determine whether any other changes (in addition to those proposed above) are necessary to the application requirements. In addition, the Agencies should permit national middle mile backbone providers to avoid answering any questions in the application that are unduly onerous to such providers

(because of the scope of the project), and instead permit such providers to file an attachment providing as much detail as is practical as to such questions, and an explanation as to why the provision of any more detail would be unduly onerous. For example, for any information in which a national middle mile backbone provider can provide such information in general, on an aggregate basis, for all of the service areas that will be benefited, but in which it would be impractical to provide such information on an individual service area by service area basis, the national middle mile backbone provider should be able to provide this information on an aggregate basis.

D. The Agencies Should Utilize Evaluation Criteria that Ensures that there is a Proper Balance of Funding in Connection with High Capacity Broadband Services for Anchor Institutions, which Includes Funding of Both National Middle Mile Backbone Networks and Final Mile Anchor Networks (Section IIA(1) of RFI)

The Agencies request comment on whether they should modify their evaluation criteria. They also seek comment on what type of proposals they should target for funding.[28]

The Agencies should utilize evaluation criteria that ensures that there is a proper balance of funding in connection with high capacity broadband services for anchor institutions, which includes funding of both national middle mile backbone networks and final mile anchor networks. As described in Section IB above, if either one of these networks lacks sufficient capacity, there will be a bottleneck, and the anchor institution will not receive the high capacity broadband service it needs. Therefore, it would be counterproductive to fund only final mile anchor networks and leave national middle mile backbone networks lacking the necessary

[28] RFI at 5-6.

capacity.[29] Accordingly, proposals from both national middle mile backbone providers and final mile anchor providers should be targeted for funding.

Thus, the Agencies need to make sure that their evaluation criteria is not inadvertently skewed against national middle mile backbone projects, but instead enables the Agencies to consider the big picture and ensure that there is a proper balance of funding. That is, in addition to looking at every tree branch individually, the Agencies also need to look at the forest as a whole, and ensure they are doing the right thing for this country and anchor institutions nationwide. While Internet2 believes there are countless ways in which to establish criteria that ensures there is a proper balance between funding national middle mile backbone providers and funding final mile anchor providers, and that the Agencies should determine the best manner for them to do so, Internet2 believes the following comments below on this point, addressing a few of the additional questions raised by the Agencies, may be helpful.

The Agencies request comment on whether they should consider, in determining funding, the number of anchor institutions that connect, or would connect, to the network.[30] The answer is yes, as long as the term "connect" includes not only direct connections but also connections via a final mile anchor network. That is, Internet2 connects to final mile anchor networks that themselves collectively connect to over 66,000 anchor institutions. Each and every one of those anchor institutions (as well as many other anchor institutions that will be connected if Internet2's network receives funding for upgrades and extensions) would benefit from upgrades and/or extensions to the Internet2 network. Accordingly, since one of the primary objectives under the ARRA is to enhance the provision of high capacity broadband services to anchor institutions (and given the limited funding available, the Agencies need to ensure that they get the most

[29] Of course, some final mile anchor networks already have sufficient capacity on their networks and do not themselves need funding. In those instances, only the national middle mile backbone network needs funding.
[30] RFI at 6.

"bang for the buck"), the Agencies should place considerable weight on the number of anchor institutions that actually benefit from any proposed project.

That approach is completely consistent with the Agencies' request for comment on how their funding can achieve the greatest possible impact, i.e., what is the most efficient use of the funds.[31] Funding national backbone middle mile network extensions and upgrades (to ensure that they have the necessary very high capacity) -- which benefit tens of thousands of anchor institutions all at once -- is an efficient use of funds because the cost of funding such a project per anchor institution is relatively small (given so many anchor institutions will benefit). Moreover, once such upgrades are completed, such networks will have extremely high capacity, and as the Organization for the Promotion and Advancement of Small Telecommunications Companies correctly recognized in comments filed with the FCC earlier this year, "it is more efficient to deploy networks with greater capacity, rather than to manage the traffic on lower-capacity networks.... [because] it is more efficient to deploy the most scalable technology from the outset."[32] Adopting any other approach will result, in a few years, in many providers being forced to totally revamp or rebuild networks to meet the needs of this country, rather than making merely minor modifications to their networks.

The Agencies also seek comment regarding whether they should consider the extent of the geographic footprint as well as any overlap with existing service providers.[33] As to the first question, the answer is clearly yes, because a significant geographic footprint helps ensure that virtually all areas of the country are benefitting, rather than just a few small pockets of areas. The concept of overlap with existing providers should not have any relevance at all with respect

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[31] RFI at 5.

[32] Comments of the Organization for the Promotion and Advancement of Small Telecommunications Companies, GN Docket No 09-47, 09-51, 09-137 (August 31,2009)
at 4-10.

[33] RFI at 6.

to national middle mile backbone networks supporting anchor institutions, such as the type that Internet2 operates. Often private incumbent providers do not have sufficient capacity to support the anchor institutions, cannot provide other added benefits that anchor institutions need, seek to charge extraordinarily high prices, or place other restrictions violating certain net neutrality principles or otherwise, such that they are not a viable option for such institutions. Moreover, it would be unwieldy and wholly impractical to try to analyze the impact of private incumbent providers on a community by community basis for a national project.

With respect to the Agencies' request for comment regarding whether they should consider promoting a regional economic development approach to broadband deployment to ensure that there is a long term vision to maximizing the benefits of broadband deployment, Internet2 fully agrees that considering the issues from a big picture perspective is important. But in addition to the regional approach, the Agencies also must view this from the national perspective in the manner described above. Only through such an approach will the Agencies ensure that the long-term vision concerning maximizing the benefits of broadband deployment nationwide – and not just in some areas -- is reached.

In addition, the Agencies have requested comment regarding whether they should give greater weight to middle mile projects in which last mile residential providers have already agreed to interconnect. While such an approach appears to be inappropriate in the context of final mile anchor networks, for at least two reasons, it is undoubtedly unworkable, and inappropriate, for national middle mile backbone network applications that benefit tens of thousands of anchor institutions. First, such networks are sufficiently beneficial (without considering the impact of anchor institutions as hubs to the last mile residential networks) given the sheer number of anchor institutions they benefit. Second, it would be completely unwieldy

for any national middle mile backbone provider to try to obtain such information regarding thousands of areas.

The Agencies also request comment on any other matters that commenters believe are relevant. Internet2 strongly believes that the Agencies should provide a mechanism for proposals to link to each other so that the Agencies can see the bigger picture as opposed to simply individual applications (but the Agencies should not mandate that applicants provide such links).

Finally, Internet2 believes that state review of applications for national projects, such as applications by national middle mile backbone providers, should not be required. Internet2 believes that such review is unnecessary and unwieldy, as the project may benefit all, or nearly all, 50 states, and would therefore be reviewed by virtually all of the states. Rather, for such national, clearly interstate, applications, the Agencies alone should be responsible for reviewing and analyzing the proposed project.

## II. COMMENTS ON OTHER ISSUES

### A. Whether the Agencies Should Give Greater Weight to Applications that Benefit Certain Institutions, such as Educational Facilities, and What Attributes are Likely to Render a Project the Most Sustainable (Section IIA(1) of the RFI)

The Agencies seek comment on (i) whether they should give greater weight to applications that benefit certain types of anchor institutions, such as educational institutions, and (ii) what attributes are likely to render a project the most sustainable.[34] While it is not clear that the Agencies should provide greater weight to service to educational institutions than to service to certain other anchor institutions, what is clear is this: the most sustainable projects providing service to educational institutions are those operated by experienced parties who are completely

[34] RFI at 5-6.

familiar with the educational industry, and who have had tremendous success in serving the industry, such as Internet2. Such parties know all of the issues related to whether a project will be successful – because they have repeatedly and successfully completed projects in the past for the same types of entities.

B. Definition of Underserved and Unserved Areas for Anchor Institutions (Section IIB of the RFI)

In light of the language of the ARRA itself, projects for anchor institutions should not need to be located in unserved or underserved areas to be funded. But if NTIA disagrees, or wishes to give greater weight to anchor institution projects that are at least partly in unserved or underserved areas, it should modify its definition of unserved and underserved areas as it applies to service to anchor institutions. In defining whether an area is unserved or underserved in connection with the provision of services to anchor institutions, NTIA should focus on whether anchor institutions in such locations are receiving broadband services that are sufficient to meet their needs. But it is readily understood that most anchor institutions today request and need broadband capacity of at least 1 Gbps. Accordingly, in determining whether there are a dearth of anchor institutions in an area having access to the broadband service they need, and thereby warranting a designation of such area as being unserved or underserved, the standard should be based on whether such anchor institutions have access to at least 1 Gbps service. It is completely irrelevant to anchor institutions that certain nearby residents have access to DSL, for example, and that certainly should not therefore qualify their area as "served" as to those anchor institutions, who themselves lack access to service of at least 1 Gbps, which are generally their requirements.

C. Comments from Final Mile Anchor Providers

Several last mile anchor providers who operate and manage research and education networks have requested that Internet2 submit their views concerning the RFI as well, which include the following:

- The Agencies should ensure that at the time they release the grant guidelines to any parties, they publish those guidelines on the Internet for all to review, so that some parties do not have more time than others to prepare their applications based on the guidelines.

- The Agencies should provide a longer time period (than they did in the prior round) between release of the on-line application portal, and the due date for applications, and, in general, they should provide parties with a longer period of time to prepare the application once all of the rules are issued.

- The Agencies should seek to ensure that parties can easily preview uploaded attachments before submitting them, and readily generate a final copy of all uploaded files.

- If workshops are scheduled, the Agencies should provide more than one week notice for the dates for such workshops.

- For final mile anchor networks, the evaluation criteria should place greater emphasis on delivering broadband services to low-income and disadvantaged populations. Federal poverty rate, lower per capita income versus state and national averages, local unemployment, even free and reduced lunch qualifications, provide useful information that the Agencies can use to analyze whether a final mile anchor network proposal should be granted.

- The Agencies should permit applicants to rely on data that is more current than the local 2000 Census Data, to the extent such data is available.

- The definitions of unserved and underserved should be based on information that is publicly available, because if it is based on private information in the possession of telecommunication companies, that discourages parties from filing.

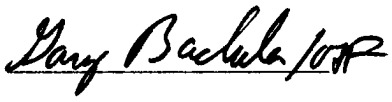
- Any restrictions on the sale or lease of funded facilities under the rules should not apply to IRUs or leases to research and education networks, as research and education networks need to maximize their options with respect to access to such facilities (which they ordinarily utilize via long term leases or IRUs). The

Agencies can obtain this result by defining "service providers," for purposes of the exception to the restriction on the sale or lease of funded facilities, to include providers that manage and operate research and education networks. Alternatively, the Agencies could simply implement a separate exception permitting leases or IRUs to research and education networks.

## CONCLUSION

For all of the foregoing reasons, the Agencies should take action consistent with the comments set forth herein.

Respectfully submitted,



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